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ABSTRACT

A study investigated whether text illustrations improve the reading comprehension of second graders. Subjects, 14 second-grade students, read five stories from a basal reader. The control group read each story with accompanying illustrations, while the experimental group was exposed to only the written version of the same stories. Questions based on the written version were administered to measure students' comprehension. Results showed that there was no significant difference between the groups. (Tnree tables of data are included, and 23 references are attached.) (SR)

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THE EFFECT OF ILLUSTRATIONS ON SECOND GRADERS' READING COMPREHENSION

by

Gina Parisi

Presented in partial fulfillment of the requirements
for the Master of Arts Degree
Kean College of New Jersey
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ABSTRACT

Do text illustrations enhance students' comprehension of the story or are the pictures provided for visual pleasure? This study was conducted to determine whether or not a story with corresponding pictures improves the reading comprehension of second graders.

Two samples of second grade students were set up to read five stories taken from a basal reader. The control sample read each story with accompanying illustrations. The experimental sample was only exposed to the written version to each of the same stories. Questions based on the written text only were administered to measure the students' comprehension. Records were kept for both samples and scores from the questions were tabulated and utilized to find the students' *t*-test. The results showed that there was no significant difference among the samples as a result of reading the same stories with or without illustrations.

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In recent years, basal readers have become more and more enjoyable for primary students due to the bright and attractive illustrations which accompany the written print of each story. Do these illustrations enhance students' comprehension of the story or are the pictures provided for motivation and visual pleasure?

Very often educators use visuals, such as tables, graphs, and pictures, to help organize ideas for their students. This is done to bring across a better understanding of the information. Concerns about the effects of illustrations in stories and whether they increase reading comprehension have been examined by researchers for many years. Studies reported by Miller (1938), Samuels (1970), and O'Keefe and Solman (1987), have shown illustrations to have little or no influence on children's comprehension. In contrast, Rice, Doan, and Brown (1981) have found that children who read books with pictures had a higher comprehension than the children who read the same story without pictures. A contradiction on this topic was even found within the same study performed by Koenke and Otto (1969). The researchers found illustrations to have no influence on third grade students' comprehension, whereas, sixth graders' comprehension did benefit from the pictures. The results of these studies and others have caused researchers to continue

investigations on whether or not illustrations enhance children's reading comprehension.

According to Burns, Roe, and Ross (1984) illustrations are a very good source of information and may add considerably to a child's understanding of the print. Even as early as 1955, Yoakam regarded illustrations as an aid in the development of meaning. He states that large colored pictures are preferred most by young children. Besides noticing the decorative qualities of illustrations, primary students tend to enjoy using the pictures to identify some of the story details presented in the print. For instance, after reading details about the characters, the students are able to distinguish the characters in the illustrations. In agreement with this view, Elster and Simons (1985) stated that pictures are used to illustrate characters and locations in stories that have controlled vocabularies. They add that pictures in basal readers are used to link the gap between spoken and written language. They state that illustrations tie parts of the story together and the pictures emphasize a part of the story.

Koenke (1987) believes that pictures aid comprehension when the text is poorly structured. Yoakam (1955) stated that pictures should not interfere with the printed matter which is usually found below the pictures in primary books. He adds that the

subject matter of the pictures should agree with the textual matter that accompanies them. Koenke also states that people use illustrations differently. Pictures do not benefit all readers in the same way. O'Donnell (1983) notes that adults interpret pictures differently than children do. He suggests that the teacher provide instruction for the accompanying illustrations in order to ensure the students with the correct picture meaning.

O'Donnell continues to add that comprehension may be confused with recall. Haring and Fry (1979) used recall to measure the effects of pictures on children's reading comprehension. Rohwer and Matz (1975) found that children can seek information more rapidly from pictures than from printed representations. The pictures were found to elicit comprehension and therefore, gave students in pictorial conditions time to rehearse their responses.

Like Logan (1983) who surveyed recent research on this topic, researchers continue to study the effects that visual material or illustrations have on students' reading comprehension. However, there are studies as far back as Miller's and as recent as O'Keefe and Solman's which concluded that the influence of illustrations on comprehension was small for children of normal reading ability. The results seem

to vary depending upon different situations and subjects.

HYPOTHESIS

To provide more evidence on this topic and perhaps clarify the issue somewhat, the following study was conducted to determine whether or not a story with corresponding pictures improves the reading comprehension of second graders. The hypothesis was that there is a non-significant relationship between the illustrations of a story and reading comprehension since the addition of pictures to text will have no effect on second graders' comprehension of a story when compared to the comprehension of a sample reading the same story without pictures.

DEFINITIONS

For the purpose of this research, Basal Reader is defined as a reading program which includes teacher-led instruction followed by practice and application skills. The goal is to teach children how to understand, enjoy, and use written language. Reading Comprehension is referred to the process of grasping meaning of the written language. Illustrations are those used as the pictures which accompany the related stories.

PROCEDURES

To test the hypothesis a heterogeneous sample of 14 second grade students from a middle class community in New Jersey was selected. The participants ranged between the ages of seven and eight and were of average to high reading ability level.

The procedures for the study included randomly assigning students to either of two treatment samples, each consisting of seven students. The control sample was asked to read stories which contained corresponding illustrations. The experimental sample was only exposed to the printed version of the stories. Five story texts were taken from a Level 7 Ginn and Company Basal Reader. The story text in all five stories was the same for both samples. Each story was introduced simultaneously to both samples during five different settings. After reading each story, the two samples were given the same test to measure reading comprehension. Each test consisted of 10 factual and inference level questions based on the written text only. Scores from the comprehension questions were then tabulated and subjected to tests of significance of differences.

RESULTS

To analyze the results of this study, the mean scores of the two samples were compiled from the

raw scores of five tests (See APPENDIX A). The means were then compared utilizing students' t test. The purpose was to determine if there was any significant difference between the samples as a result of reading the same story with or without corresponding illustrations.

Table I illustrates the findings in respect to the experimental sample (where seven students

TABLE I

Mean, Standard Deviation, and t-Test of the Samples

	M	SD	t
without pictures	43.29	4.03	
			.89
with pictures	41.00	5.48	

received the story without accompanying illustrations) and the control sample (where seven students received the story with pictorial material accompanying it).

As indicated by the table, the means of the two samples were 43.29 and 41.00 respectively. Although there was a 2.29 difference between the means, this difference was not significant as shown by the t of .89.

CONCLUSIONS AND IMPLICATIONS

In the analysis of the students t-test, the findings indicate that there is no significant difference as a result of the variable among the two samples.

It is interesting to note that the highest mean score was reached with the experimental sample, where pictures were not included with the written text. While observing the students during the classroom experiment, it was noticed that the students in this sample referred back to the context of the story and reread certain passages while answering the comprehension questions. Since there were no pictorial aids to act as cues, it was inferred that the students had to reread parts of the text for clarification to comprehension. The students were unable to rely on the illustrations to enhance memory.

Another observation made was that most of the control sample, which had accompanying pictures, seemed to complete the comprehension test for each story at a faster rate. The students used the pictures to stimulate memory of the text and to locate the possible page in which the answer was found. Some students would reread to pinpoint the answer, where others wrote the answer after viewing the pictures and enhancing their memory. This factor may be the cause for the slight difference between the means of the two samples.

The null hypothesis that there would be no significant difference in comprehension between the samples was accepted since there was no statistically significant difference found.

Based on mean differences between the samples only, it would appear that the best approach would be to eliminate accompanying illustrations from basal readers. One student from the control sample quoted, "It feels good reading the story without pictures because I can guess what the pictures may look like." Does this bring about another relative question as to whether or not illustrations in basal readers hinder one's imagination or creativity? Since there was no statistically significant evidence to support the inclusion or exclusion of illustrations with a story, more in-depth research should be conducted to provide more conclusive results.

ILLUSTRATIONS AND READING: Related Research

One of the most important and complicated process a child will face is the act of reading. Reading is a process which requires the reader to understand the written print. It encourages one to identify with the story characters and with the story action. Reading can also provide vicarious experiences to the reader. To motivate or help the reader along, almost every children's story or book today provides illustrations. Researchers have found illustrations to be useful for various reasons depending upon many factors, such as the content of the written material and the age of the reader. For each positive purpose of illustrations in texts found by researchers, other studies have been conducted to prove that illustrations have little or no effect to the reader or to the written print. This topic of the effects pictures have on the reader brings about many considerable and controversial questions. What purpose do illustrations have in books? What service do illustrations provide for the reader?

O'Donnell (1983) surveyed research and found information about the characteristics and use of illustrations. He reviewed issues about the color and simplicity of pictures. Yoakam (1955) believed children prefer large pictures rather than small ones and strong colors instead of pastels. He stated that

children are attracted to colored pictures rather than black-and-white.

In contrast, Cianciolo (1976) approves of black-and-white and monochrome illustrations in children's books as long as shading and contrasts are used. She indicates that shading can be used to make the figures stand out, to express action, and reflect some degree of warmth and vitality. She also agreed with Yoakam (1955) that color can be one way to attract children's attention to reading a book. To serve an expressive rather than a representational color sense, illustrations should have plenty of rich and harmonious color added Cianciolo (1976). Other researchers (Miller, 1938; Legenza and Knafle, 1978; Schallert, 1980; and Logan, 1983) have agreed that one use of illustrations is to attract and motivate children to the reading process.

Once again, a positive statement in one study is found to be contradicted by another research study. One aspect of a study by Rice, Doan, and Brown (1981) was to examine the effect of pictures on story interest in second graders. Both samples, one with accompanying story illustrations and the other without, were asked to complete an inventory to measure story interest. The inventory involved the students to select smiling or non-smiling faces to express their feelings of the story. The study disregarded interest levels as a

factor because the results obtained showed that the students liked the book with or without pictures.

Another issue O'Donnell (1983) noted about illustrations was their placement on the written page. He found this to be a concern for some researchers. In O'Keefe and Solman's (1987) study, placement and association of pictures were found to be a crucial aspect of presentation in the story. But pictures should not interfere with the printed matter according to Yoakam (1955). He made a point that pictures should be placed above the printed words and they should agree with the textual matter that accompanies them.

Experiments with 32 second graders and 34 third graders led Willows (1978) to believe that pictures in the periphery do affect children's speed and accuracy of reading. He found that words were read more slowly whenever pictures were present. The size of the interfering effect of the pictures depended on their relevance to the words printed near them. For instance, when a child came to a word he already knew, the pictures in the periphery were considered distracting or useless. If the child did not know the meaning of a word while reading, he usually looked to the picture for a clue. Reading ability was therefore, an influence on the study. The location of the illustrations was not a major factor to Willows' study. Although it was not statistically significant, the

means showed that the degree of interference by pictures was reduced when the pictures were moved from behind to above the words. This supports Yoakam's (1955) earlier statement.

In relation to Willows (1978), Rice, Doan, and Brown (1981) also studied the effect of illustrations on the speed of reading of second grade children. They used an experimental group, which did not have an illustrated story, and a control group which read the same story with pictures. Once the subjects read the story independently they turned up a number card on their desk. As the number cards were turned up the reading time was recorded in seconds for each student. The results of this study supported the previous research of Willows (1978) which stated that pictures tend to slow down the reading time.

Whether or not illustrations stimulate children's language is yet another contradiction to this area of study. Very often pictures are used by educators to develop language skills of bilingual children and for children whose homes do not emphasize the importance of language skills. Since language skills and thinking skills coincide with one another, a good language foundation is needed early on for children to do well. (Legenza and Knafle, 1978; and Logan, 1983) The use of pictures to facilitate language is questionable by researchers.

Teachers of primary grades also use pictures to build a background for the story, to introduce the meaning of new words in the story, and as prompts when children cannot recognize printed words. Samuels (1967) conducted two studies, one in a laboratory and the other in a classroom, to determine the effect of pictures on learning to read words. He tested the hypothesis that when pictures and words are presented together, the pictures act as a distractor which interferes with the reading process. Although pictures may be used as prompts when the reader cannot read a word in the text, they may also miscue and divert attention from the printed words.

The laboratory study (Samuels, 1967) involved two groups of randomly-assigned kindergarten children who learned to read words with or without pictures. The task for both samples involved a learning trial followed by a test trial. The results indicated that during the learning trials, the sample which had the pictures gave significantly more correct responses. However, on the test trials when pictures were not presented as prompts, the no-picture sample gave significantly more correct responses.

Due to the many limitations of a laboratory study, Samuels (1967) continued his research with a classroom study using a sample of first graders. The procedure was similar to that used in a classroom with

seven months of reading instruction. Special reading material was prepared and randomly assigned to a picture or to a no-picture condition. This was the only difference between groups. As the data indicated, pictures had no effect on the better readers and were found to interfere with the acquisition of a sight vocabulary among the poor readers. Schallert (1980) summarizes Samuels' (1967) study by stating that because pictures can reliably elicit an appropriate verbal response, they interfere with the beginning reader's ability to concentrate on and learn to discriminate properly the printed stimuli.

Before presenting challenging studies (Denburg, 1976-1977; Donald, 1979; and Donald, 1983) on this issue, one last study is presented in support of Samuels (1967, 1970). In clarification, Samuels (1967, 1970) indicated that pictures when used as adjuncts to printed text do not facilitate learning or comprehension. Samuels also explained that pictures had no effect on the better reader and the presence of pictures interfered with learning on the poor readers. This held true for Willows (March, 1978).

Willows' (March, 1978) research was designed to determine whether the difficulty of the words being read influenced the extent to which good, normal, and poor readers' decoding was susceptible to influence by adjunct pictures. Ninety-one third graders were

required to read easy, moderate, and difficult one-syllable nouns under three conditions. There was one control condition with no-pictures, an identifying-picture condition, and an unrelated-picture condition. The results showed that the reading performance of poor readers as a group was influenced by pictures under all conditions. The normal and good readers were less affected by the pictures. There were also marked individual differences among the poor readers in the degree of their susceptibility to distraction.

In contrast to Samuels (1967, 1970), Denburg (1976-1977) performed a study to examine the effect of increasing amounts of pictorial information on word identification and word learning of 48 first graders. Students had to read aloud test words that appeared in context after reading the sentence. Because the beginning reader has limited familiarity with print, pictures were used as an additional source of information from which the reader was able to refer to while reading. Denburg's study indicated that more words were read correctly if they were also represented by a picture. The use of pictures had a strong effect on the children's word identification in context. However, the results showed a smaller, though significant, facilitative effect on word learning. The study clearly showed evidence of an integration of

partial information from both text and context. Unlike Samuels (1970) who continued his view that pictures may well be a distraction, Denburg concluded that additional pictorial information encourages the beginning reader to use whatever information he or she is able to obtain from the printed page.

Concurring with Denburg (1976-1977) is Donald (1979). He demanded that the effects of illustrations be viewed linguistically and contextually and not only on isolated word recognition. Twenty average, second year readers were given a 66-word story to read with and without pictures. He found that illustrations facilitated word identification accuracy, the rate of self-correction, and comprehension at the level of literal ideal recall. In addition, Donald's study emerged that readers made significantly more use of semantic and syntactic information with illustrated text while use of orthographic information was reduced.

The contextual hypothesis states that in learning to read continuous text illustrations may constitute a legitimate source of semantic information (Donald, 1983). Furthering his prior study, Donald (1983) used subjects at 7- and 9- year reading age levels. The subjects were both good and poor readers as determined by the D. Young Group Reading Test. Subjects read narrative extracts of 320 words with or without illustrations. Results in general confirmed

the contextual hypothesis. The poor readers derived greater benefit from the pictures than their more skilled classmates.

Very often, children need to rely on the accompanying pictures of a text in order to understand the meaning of the words. Elster and Simons (1985) conducted a study of the first grade books in two basal series and showed that the amount and type of picture dependence varies, even over the years. The researchers classified story references to characters, locations, and objects according to whether they were picture-dependent or picture-independent. Picture-dependent references required the reader to look at an illustration in order to fully understand the print. Picture-independent references are understandable without a picture. Both series reviewed by Elster and Simons were found to decrease in picture dependence as the first grade progressed. One series was also significantly more picture-dependent than the other, especially at the beginning of the year.

Children not only need to know how to decode words when learning to read, but they must learn how to look for meaning in words rather than the setting of the pictures. Elster and Simons (1985) note one use of pictures in basal readers is to bridge the gap between spoken and written language. They decided that picture-dependent stories could give children the wrong

expectations of what written language is like, or it may violate the expectations children bring to reading. Teachers need to expose their students to stories which can be easily understood without the source of illustrations. Reading aloud to children can accomplish this goal. The researchers concluded that experiences with picture-independent stories may be an effective way of leading children to look for meaning in the words and to use pictures as a supplementary aid to reading.

Like Samuels (1967) and Elster and Simons (1985), Legenza and Knafle (1978) have had similar questions about the facilitation of language from illustrated texts. Legenza and Knafle used the Picture Potency Formula to assess the language stimulation value of pictures in several widely used basal readers for first and second graders. This formula was developed by Manzo and Legenza in 1975. It classifies pictures into high, medium, and low potency pictures. The results of Legenza and Knafle's study were clear from their analysis. They stated that first and second grade basal readers do not have pictures of maximum effectiveness, in refernce to stimulating language development. Legenza and Knafle found that the majority of the pictures were of low potency. This means the pictures revealed a small amount of language such as, animals, objects, people, actions, and colors.

Since primary teachers spend a lot of time using pictures in basal readers to expand on their students' language skills, Legenza and Knafle suggested that publishers should reexamine their criteria for selecting pictures.

Cianciolo (1976) rightly points out that there are no agreed upon criteria for evaluation of illustrations in children's books. She states that illustrations have had various functions, such as decorating pages, extending a story's text, reinforcing and expanding upon a story's mood, stimulating the reader to use their imagination, comprising an essential part of a story, and highlighting major story situations. Cianciolo continues to add that illustrations in books can help the reader to create visual images and can help one to go beyond the printed word. She stated that books with illustrations can facilitate the reader's comprehension, identification, and experiencing.

Reading is defined by Wilson and Gambrell (1988) as a process involving both decoding and comprehension. They state that the ultimate goal of the reading process is comprehension, which is referred to as the understanding of the message. Because each reader brings to the reading process a unique combination of interests and background of experiences, Wilson and Gambrell have defined reading comprehension

to be the process of using one's prior experiences and text cues to infer the author's intended meaning.

Concerns about whether illustrations effect reading comprehension have been examined by researchers for many years. Studies reported by Miller (1938); Koenke and Otto (1969); Samuels (1970); Rice, Doan, and Brown (1981); and O'Keefe and Solman (1987) have shown illustrations to have little or no influence on children's comprehension.

Miller (1938) investigated whether children of grades one, two, or three secure greater comprehension when the story is accompanied by related illustrations. The students in each grade were divided into two groups. One group read the story with accompanying pictures and the other group had only the written version to the story. Miller's study supports the argument against the use of pictures to teach or improve comprehension. His study indicates that the children who read without pictures understood the material as well as the children who read the same material with pictures.

Samuels (1970) supports Miller (1938) by noting that "pictures, when used as adjuncts to the printed text, do not facilitate comprehension." O'Keefe and Solman (1987) conducted three experiments to examine the process by which pictures assist in children's comprehension of a given text. The

comparisons were made of the story recall of 70 average readers in grade five, under five picture-text conditions. Recalls were scored using a test analysis system. O'Keefe and Solman support Miller (1938) by concluding that the influence of illustrations on comprehension was small for children of normal reading ability.

Due to the failure of pictures facilitating text comprehension with grade five readers, O'Keefe and Solman (1987) continued their efforts with grade three average ability readers. The researchers took into consideration the suggestions presented by Donald (1983) that pictorial facilitation of comprehension might be enhanced if exposure to the passage is increased and if text difficulty is heightened. The grade three subjects, therefore, were allowed two readings of the grade five level passage of their previous study. Again O'Keefe and Solman's observed advantage for the picture condition did not reach significance.

A contradictory study within itself was presented by Koenke and Otto (1969). The study dealt with main idea and the contribution of illustrations on comprehension. The researchers found illustrations to have no influence on third grade students' comprehension, whereas, sixth graders' comprehension did benefit from the pictures. Sixth graders who read

the passages accompanied by pictures responded with main ideas which received significantly higher scale ratings than those students who did not see the pictures. Many of the sixth grade students without pictures responded to the main idea by stating a specific sentence from the written text. Students with the pictures tended to give an overall general response about the passage which resulted in a higher score. The difficulty of the passage according to ability level needs to be considered in order to enhance one's main idea comprehension. (Koenke and Otto, 1969)

Studies (Miller, 1938; Samuels, 1967; Samuels, 1970; Rice, Doan, and Brown, 1981; and O'Keefe and Solman, 1987) which concluded that illustrations do not effect reading comprehension have been challenged throughout the years. One study by Peeck (1974) provided evidence that illustrations have positive effects on students' retention of specific text information. Peeck used an adapted version of a familiar cartoon strip with nine and ten year old children. Some children received an illustrated story and some received the story without pictures. A retention test was given immediately following the reading of the story and another one day after and one week after. The unannounced test contained various questions from the text alone, the pictures alone, and both the text and pictures. The results for each test

were congruent. Peeck found that the group with the story illustrations was able to remember more information during each testing session.

In a similar modality, Haring and Fry (1979) conducted a study with fourth and sixth graders to determine the effect of pictures on the comprehension of text. The experimenters analyzed a written passage into idea units and then interspersed pictures depicting main idea or nonessential details throughout the text. After the reading session the subjects wrote down all they could remember about the story. This was the method used to measure comprehension and it was repeated five days later. Results of this study may begin to specify the effect of pictures on children's reading comprehension as measured by recall. Pictures were found to bring about both immediate and delayed recall of the main idea.

Another study which is supportive of previous findings by Koenke and Otto (1969); Peeck (1974); and Haring and Fry (1979) is that of Schallert (1980). In collaboration with colleagues, Schallert completed an experiment in which two groups of fourth graders were set up to read a passage. The two groups, picture group and non-picture group, were used, similar to other studies (Miller, 1938; Samuels, 1967; Koenke and Otto, 1969; Denburg, 1976-1977; and Peeck, 1974) of this nature. Students read a detailed selection on how

valves control water flow in faucets. Schallert (1980) states that the story that was illustrated provided a "spatial, schematic representation" of how the faucet parts are related and work together. The illustrations were an extension to what was provided in the text. Like Peeck (1974), children in the picture condition appeared to comprehend and learn more information than those students who did not have accompanying illustrations. The significant difference was found in the performance on a multiple-choice test and on a free recall test. Student performance did not differ on questions where the information was found only in the written text and was not contained in the illustrations. Schallert's (1980) experiment supports the idea that illustrations can help clarify the print and therefore make a good source of information.

Do illustrations have an effect on the reader? Do illustrations really serve a significant purpose in the text? The answers to these questions have been puzzling researchers for many years and will continue to excite them for years to come. The evidence is clear that for each study which shows illustrations to have a positive effect on reading, there is a study which contradicts the research. One must take into consideration the different factors of illustrations and reading and the many views on the topic and use them to suit one's own objectives.

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APPENDIX A

Table II

STUDENTS WITHOUT PICTURES	STORY					TOTAL	MEAN
	1	2	3	4	5		
Joseph	10	9	9	10	9	47	9.4
Dominique	10	7	6	7	7	37	7.4
Steven P.	10	7	9	10	9	45	9.0
Stefanie	10	9	10	10	10	49	9.8
Jessica	9	8	8	8	9	42	8.4
Steven T.	6	9	9	9	8	41	8.2
Ajay	9	7	7	10	9	42	8.4

Table III

STUDENTS WITH PICTURES	STORY					TOTAL	MEAN
	1	2	3	4	5		
Vinnie	6	5	6	7	7	31	6.2
Alishia	9	10	9	10	8	46	9.2
Ryan Mary	10	9	7	10	9	45	9.0
John	7	9	5	9	6	36	7.2
Jesse	9	9	8	8	9	43	8.6
Tyiana	7	8	9	9	9	42	8.4
Bryan	8	8	8	10	10	44	8.8

STORY TITLES

1. Madge's Magic Show
2. Sock's for Supper
3. On the Way to Bremen
4. Not This Bear!
5. Mrs. Christie's Farmhouse